

What is claimed is:

1. A gear device for use within an image forming apparatus comprising:

a shaft having a shaft first axial section offset from a shaft second axial section, the shaft second axial section having a head; and

5 a gear having a gear first axial section offset from a gear second axial section, the gear first axial section having teeth on an exterior surface and an engagement member on the gear second axial section;

the gear being operatively engaged with the shaft with the shaft first axial section positioned within the gear first axial section and the shaft second axial section mounted within the gear second axial section and the engagement member positioned behind the head.

2. The device of claim 1, wherein the shaft first axial section is at least twice as long as the shaft second axial section, and the gear first axial section is at least
15 twice as long as the gear second axial section.

3. The device of claim 1, wherein the shaft first axial section and an interior surface of the gear first axial section both have a round cross-sectional shape.

20 4. The device of claim 1, wherein the head is positioned on a distal end of the shaft.

5. The device of claim 4, further comprising a neck positioned between the head and the shaft first axial section.

25

6. The device of claim 5, wherein the engagement member has a ramped configuration that extends outward from a sidewall of the gear second axial section.

7. The device of claim 1, further comprising a pair of hubs positioned on the gear second axial section, a distance between inner edges of the pair of hubs is less than a width of the head.

5 8. The device of 1, wherein the gear and shaft are part of an image forming unit.

9. The device of claim 8, wherein the gear and the shaft are positioned within a main body of the image forming apparatus.

10 10. The device of claim 8, wherein the image forming apparatus is a laser printer.

11. The device of claim 1, wherein an outer diameter of the shaft first axial section is larger than an inner diameter of the gear first axial section.

15

12. A gear device for use within an image forming apparatus comprising:

a shaft comprising:

- i. a shaft first axial section having a round cross-sectional shape;
- ii. a shaft second axial section having a neck and a head, the neck having a smaller width than the head to form a gap; and

a gear comprising:

- i. a gear first axial section having a round cross-sectional interior and a plurality of teeth extending outward from an exterior surface;
- ii. a gear second axial section with a pair of hubs extending inward a first amount from a sidewall, and an extension extending inward from the sidewall a second amount that is less than or equal to the first amount;

the gear being relatively movable on the shaft between a first orientation with the extension positioned away from the gap, and a second orientation with the extension positioned within the gap.

13. The device of claim 12, wherein the shaft first axial section and the gear first axial section are located within a first axial plane, and the shaft second axial section and the gear second axial section are located within a second axial plane that is offset from the first axial plane.

14. The device of claim 13, wherein the first axial plane is substantially parallel with the second axial plane.

15. The device of claim 12, wherein contact surfaces of the pair of hubs are positioned about 180° apart.

16. The device of claim 15, wherein the head width is greater than a distance between the pair of hubs.

5 17. The device of 12, wherein the gear and shaft are part of an image forming unit.

18. The device of claim 12, wherein the gear and the shaft are positioned within a main body of the image forming apparatus.

10 19. The device of claim 12, wherein an outer diameter of the shaft first axial section is larger than an inner diameter of the gear first axial section.

20. A gear device for use within an image forming apparatus comprising:

a first section positioned within a first axial plane and having an interior member mounted within an inner diameter of an exterior member, the exterior member having outwardly-extending teeth; and

5 a second section positioned within a second axial plane, the second section having a first engagement section at a distal end of the interior member that engages a second engagement section of the exterior member;

the first axial plane is offset from the second axial plane.

10 21. The device of claim 20, wherein the interior member is co-axial with the exterior member.

22. The device of claim 20, wherein the first section is at least twice as long as the second section.

15

23. The device of 20, wherein the gear and shaft are part of an image forming unit.

24. The device of claim 20, wherein the gear and the shaft are positioned within
20 a main body of the image forming apparatus.

25. The device of claim 20, wherein an outer diameter of the interior member is larger than an inner diameter of the exterior member.

25

26. A image forming unit for use within an image forming apparatus comprising:
a developer member;
a shaft operatively connected to the developer member comprising:

- 5 i. a shaft first axial section having a round cross-sectional shape;
 ii. a shaft second axial section having a neck and a head with a gap formed therebetween; and

a gear operatively connected to the shaft comprising:

- 10 i. a gear first axial section having a round cross-sectional interior and a plurality of teeth extending outward from an exterior surface;
 ii. a gear second axial section having an open face with a pair of hubs extending inward from a sidewall a first amount, and an extension extending inward from the side
15 wall a second amount that is less than or equal to the first amount;

the gear being relatively movable on the shaft between a first orientation with the extension positioned away from the gap, and a second orientation with the extension positioned within the gap.

20

27. The device of claim 26, further comprising a housing defining an exterior of the image forming unit, with the gear and a distal end of the shaft being on an outside surface of housing.

25 28. The device of claim 27, further comprising a toner reservoir positioned within the housing to contain a supply of toner.

29. The device of claim 27, wherein an outer diameter of the shaft first axial section is larger than an inner diameter of the gear first axial section.

30

30. A method of engaging a gear unit within an image forming apparatus, the method comprising the steps of:

positioning a gear over a shaft with a first axial section of the gear aligning with a first axial section of the shaft, and a second axial section of the gear

5 aligning with a second axial section of the shaft;

rotating the gear relative to the shaft with an outer diameter of the first axial section of the shaft moving within an inner diameter of the gear, and a pair of extensions on an inner side wall of the second axial section of the gear mating within a gap at the second axial section of the shaft; and

10 engaging teeth positioned on an exterior surface of the first axial section of the gear with a second gear within the image forming device.

31. A method of rotating a developer member within a image forming unit comprising the steps of:

15 positioning a gear over a shaft with a first axial section of the gear aligning with a first axial section of the shaft, and a second axial section of the gear aligning with a second axial section of the shaft;

rotating the gear relative to the shaft with an outer diameter of the first axial section of the shaft moving within an inner diameter of the gear, and a pair
20 of extensions on an inner side wall of the second axial section of the gear mating within a gap at the second axial section of the shaft; and

rotating a developer member.

32. The method of claim 31, further comprising engaging teeth positioned on an
25 exterior surface of the first axial section of the gear with a second gear of the image forming unit.